PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for November, 1890, as determined from the reports of nearly 2,000 stations, is exhibited on chart III. In the table of Signal Service data the total precipitation and the departure from the normal are given for each Signal Service station. The figures opposite the names of the geographical districts in the columns for precipitation and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the precipitation is below the normal and subtracting when above.

The heaviest precipitation for November, 1890, was reported in south-central Louisiana, northeast Arkansas, extreme southwest Tennessee, west-central and northwest Kentucky, along the east coast of south Florida, and in extreme northwest Washington, where it exceeded 6.00. Over a greater part of north California, east Oregon, south Idaho, north Nevada, and northwest Utah, and at stations in southeast California, north-central North Dakota, southwest Nebraska, west-central New Mexico, east-central Texas, east and southeast Mississippi, southeast Tennessee, central Alabama, central Georgia, west South Carolina, west North Carolina, and southeast Virginia no precipitation was reported.

The precipitation was in excess of the November average in an area extending over a part of the middle-eastern and southeast slopes of the Rocky Mountains and the middle Missouri valley and from Arizona to the lower Ohio valley, and at stations in the lower lake region, the middle Saint Lawrence valley, west Nova Scotia, and south Florida; elsewhere it was deficient. The greatest excess in monthly precipitation occurred at Cairo, Ill., Fort Smith, Ark., and Key West, Fla., where it exceeded 2.00. The most marked deficiency was noted on the north Pacific coast and at Hatteras, N. C., where it was more than 5.00, and the precipitation was more than 4.00 below the average in east Tennessee, north Georgia, and at New Orleans, La.

Considered by districts the average percentage of the normal in districts where the precipitation was in excess was about as follows: Key West, Fla., 200 per cent.; southeast slope of the Rocky Mountains, 181 per cent.; southern plateau, 112 per cent.; Missouri Valley, 110 per cent.; and lower lake region, 102 per cent. In districts where the precipitation was deficient the percentage of the normal was about as follows: northern plateau, 2 per cent.; east Gulf states, 13 per cent.; south Atlantic states, 14 per cent.; middle Atlantic states, 17 per cent.; middle plateau, 18 per cent.; north Pacific coast, 27 per cent.; New England, 31 per cent.; extreme northwest, 32 per cent.; south Pacific coast, 33 per cent.; Rio Grande Valley, 55 per cent.; Ohio Valley and Tennessee, 61 per cent.; upper lake region, 70 per cent.; northeast slope of the Rocky Mountains, 71 per cent.; upper Mississippi valley, 78 per cent.; west Gulf states, 79 per cent.; and middle-eastern slope of the Rocky Mountains, 85 per cent. At stations on the middle Pacific coast having long records no precipitation was noted, while the average precipitation for November in that district is 2.83.

For the period January to November, 1890, inclusive, the precipitation in the west Gulf states, the Ohio Valley and Tennessee, and the lower lake region was one-tenth to two-tenths greater than the average, while in the south Atlantic and east Gulf states, the Rio Grande and Missouri valleys, the northeast and middle-eastern slopes of the Rocky Mountains, the middle and northern plateau, and the north and south Pacific coasts it ranged from two-thirds to three-fourths of the average. In the middle Atlantic states, at Key West, Fla., in the extreme northwest, on the southeast slope of the Rocky Mountains, over the southern plateau region, and on the middle Pacific coast the precipitation about equalled the average for the period named.

The heaviest precipitation ever reported for November was noted at Fort Stanton, N. Mex., and Fort Apache, Ariz., in 1890, when the excess above the normal was about 1.50; in Arkansas and north Louisiana in 1889, when the excess varied from 2.00 to 5.00; along the north Pacific coast, in California, and west Nevada in 1885, when the excess was 5.00 to 6.00 on the Washington coast, and varied from 3.00 at Winnemucca, Nev., and 4.00 at Los Angeles, Cal., to about 13.00 at Red Bluff, Cal.; from the lower Missouri valley northeastward over the upper lakes and Lake Erie in 1879, when the excess varied from 2.00 to 5.00; and in Maryland, the District of Columbia, and central and northern Virginia in 1877, when the excess varied from 3.00 to 6.00.

The least precipitation ever reported for November was noted at stations in the Atlantic coast states from south New England to Georgia, in the east Gulf states, the upper Missouri valley, the middle and northern plateau regions, and along the Pacific coast in 1890, when the deficiency below the normal was 3.00 to 4.00 in south New England, 2.00 to 5.00 in the middle and south Atlantic and east Gulf states, 0.30 to 0.40 in the upper Missouri valley, 0.80 to 1.75 in the middle and northern plateau regions, about 6.00 on the north Pacific coast, 2.00 to 3.50 on the middle Pacific coast, and 0.87 to 1.61 on the south Pacific coast. The current month was the first November in the history of the Signal Service during which no rainfall occurred at Red Bluff and San Francisco, Cal. At Sacramento, Cal., no rain fell in November, 1884, at Los Angeles, Cal., in November, 1878 and 1883, and at San Diego, Cal., in November, 1872 and 1878. The least precipitation for November was noted at stations in the Rio Grande Valley in 1879, when the deficiency varied from 0.55 to 2.25; in northern and eastern New England in 1882, when the deficiency was 2.00 to 3.00; along the Mississippi River from Saint Louis, Mo., to La Crosse, Wis., in 1875, when the deficiency was 1.00 to 2.00; and in the Ohio Valley and at Lake Erie stations in 1872, when the deficiency was 2.00 to 3.50.

In 1879, when the precipitation was the heaviest ever reported for November from the lower Missouri valley over the upper lake region, it was the least noted for that month in the lower Rio Grande valley.

DEVIATIONS FROM AVERAGE PRECIPITATION.

The following table shows for certain stations, as reported by voluntary observers, (1) the average precipitation for November for a series of years; (2) the length of record during which the observations have been taken and from which the average has been computed; (3) the total precipitation for November, 1890; (4) the departure of the current month from the average; (5) and the extremes for November during the period of observation and the years of occurrence:

State and station.	County.	(1) Average for the month of Nov.	(2) Length of record.	(3) Total for Nov., 1890.	(4) Departure from average.	(5) Extremes for Nov.			
						Greatest.		Least.	
						Am't.	Year.	Am't.	Year.
Arkansas.		*Inches*	*Years*	*Inches*	*Inches.*	*Inches*		*Inches.*	
Lead Hill	Boone	4.19	9	3.38	−0.81	5.77	1883	2.50	1885
California.									
Sacramento	Sacramento	2.06	40	T.	−2.06	9.65	1885	0.00	'50,'62
Connecticut.									
Middletown	Middlesex	4.01	30	0.75	−3.26	7.29	1877	0.75	1890
Florida.									
Merritt's Island	Brevard	2.32	12	4.00	+1.68	5.67	1884	0.17	1886
Georgia.									
Forsyth	Monroe	3.62	16	0.50	−3.12	5.41	1888	0.50	1890
Illinois.									
Peoria	Peoria	2.34	34	1.79	−0.55	4.93	1879	0.31	1865
Riley	McHenry	2.31	39	1.74	−0.57	8.38	1876	0.08	1862
Indiana.									
Logansport	Cass	3.70	14	2.05	−1.65	5.76	1881	1.43	1880
Vevay	Switzerland	3.30	25	2.92	−0.38	6.34	1888	0.73	1872
Iowa.									
Cresco	Howard	1.52	19	1.59	+0.07	5.20	1879	0.18	1875
Monticello	Jones	2.39	35	2.21	−0.18	5.72	1862	0.12	1865
Logan	Harrison	1.37	20	1.32	−0.05	3.85	1871	0.00	1873

Deviations from average precipitation—Continued.

State and station.	County.	(1) Average for the month of Nov.	(2) Length of record.	(3) Total for Nov., 1890.	(4) Departure from average.	(5) Extremes for Nov.			
						Greatest.		Least.	
						Am't.	Year.	Am't.	Year.
Kansas.		*Inches*	*Years*	*Inches*	*Inches.*	*Inches*		*Inches.*	
Lawrence	Douglas	1.90	24	2.56	+0.66	5.15	1879	0.01	1872
Wellington	Sumner	1.06	11	3.14	+2.08	3.14	1890	0.18	1886
Louisiana.									
Grand Coteau	St. Landry	3.33	7	1.51	−1.82	5.72	1883	1.51	1890
Maine.									
Orono	Penobscot	4.69	20	2.67	−2.02	8.76	1886	1.78	1882
Maryland.									
Cumberland	Allegany	2.29	19	1.83	−0.46	5.34	1889	0.82	1887
Massachusetts.									
Amherst	Hampshire	4.72	45	1.34	−3.38	7.48	1854	1.33	1882
Newburyport	Essex	4.51	12	1.52	−2.99	8.15	1889	0.97	1882
Somerset	Bristol	4.79	18	1.04	−3.75	9.02	1876	1.04	1890
Michigan.									
Kalamazoo	Kalamazoo	2.73	14	2.54	−0.19	5.77	1877	1.25	1882
Thornville	Lapeer	2.99	13	2.70	−0.29	4.90	1885	1.42	1882
Minnesota.									
Minneapolis	Hennepin	1.36	24	0.39	−0.97	4.13	1868	0.31	1878
Montana.									
Fort Shaw	LewisaClarke	0.43	20	0.61	+0.18	0.89	1880	0.01	1877
New Hampshire.									
Hanover	Grafton	3.80	38	1.71	−2.09	6 62	1885	0.59	1882
New Jersey.									
Moorestown	Burlington	3.46	27	0.98	−2.48	7.02	1889	0.98	1890
South Orange	Essex	3.77	20	0.78	−2.99	11.37	1889	0.78	1890
New York.									
Cooperstown	Otsego	3.07	36	3.17	+0.10	5.38	1858	1.45	1876
Palermo	Oswego	3.66	36	3.95	+0.29	6.60	1866	1.01	1882
North Carolina.									
Lenoir	Caldwell	3.52	18	0.00	−3.52	7.60	1877	0.00	1890
Ohio.									
N. Lewisburgh	Champaign	3.39	15	3.25	−0.14	5.75	1888	0.85	1884
Wauseon	Fulton	3.18	18	2.25	−0.93	5.83	1881	1.46	1884
Oregon.									
Albany	Linn	4.14	11	0.44	−3.70	8.40	1885	0.44	1890
Eola	Polk	4.32	20	1.42	−2.90	13.01	1877	1.42	1890
Pennsylvania.									
Dyberry	Wayne	3.35	19	1.68	−1.67	7.00	1886	1.40	1882
Grampian Hills	Clearfield	3.07	21	1.73	−1.34	6.03	1886	1.42	1872
Wellsborough	Tioga	4.75	11	0.93	−3.82	9.07	1889	0.93	1890
South Carolina.									
Statesburgh	Sumter	1.97	9	0.90	−1.07	3.90	1882	0.87	1886
Tennessee.									
Austin	Wilson	3.99	20	1.57	−2.42	7.24	1874	1.57	1890
Texas.									
New Ulm	Austin	5.05	18	1.20	−3.85	14.93	1873	0.48	1887
Vermont.									
Strafford	Orange	3.60	17	2.00	−1.60	6.20	1888	0.50	1874
Virginia.									
Birdsnest	Northampton	3.08	21	T.	−3.08	5.80	1885	T.	1890
Washington.									
Port Townsend	Jefferson	2.79	15	0.96	−1.83	9.21	1874	0.39	1884
Wisconsin.									
Madison	Dane	2.02	21	1.93	−0.09	4.92	1856	0.53	1870

EXCESSIVE PRECIPITATION.

Precipitation to equal or exceed 10.00 was not reported for November, 1890.

In November of preceding years monthly precipitation to equal or exceed 10.00 has been reported for 21 years in Oregon; for 20 years in Wash.; for 12 years in Cal.; for 9 years in Miss.; for 7 years in Ala. and Mass.; for 6 years in N. Y.; for 5 years in Tex.; for 4 years in La.; for 3 years in Ark., Fla., Ga., Md., N. J., and N. C.; for 2 years in Del., Ind., Me., and N. H.; and for 1 year in Conn., Ky., Mich., Mo., Va., and Wis. In states and territories other than those named precipitation to equal or exceed 10.00 has not been reported for November. Among the heavier monthly rainfalls reported for November are: 31.93 at Crescent City, Cal., in 1885; 29.38 at Delta, Cal., in 1885; 27.60 at Neah Bay, Wash., in 1865; 24.75 at Fort Gaston, Cal., in 1865; 24.54 at Fort Gaston, Cal., in 1885; 24.12 at Georgetown, Cal., in 1875; 22.40 at Meadow Valley, Cal., in 1865; 22.21 at Fort Stevens, Oregon, in 1887; 20.89 at Point Pleasant, La., in 1877; 20.70 at Tatoosh Island, Wash., in 1869; and 20.51 at Downieville, Cal., in 1859. Exclusive of the instances and years cited monthly precipitation to equal or exceed 15.00 in November has been reported for 8 years in Wash.; for 7 years in Oregon; for 2 years in N. H.; and for 1 year in Ark., Fla., La., Me., and N. Y.

Precipitation to equal or exceed 2.50 inches in 24 hours was reported at 8 stations in La., and on 3 dates, the 15th to 17th; at 3 stations in Fla., and on 2 dates, the 28th and 29th; at 3 stations in Ky., and on 2 dates, the 15th and 16th; at 2 stations in Miss., on the 16th; at 1 station in Ala., on the 17th; at 1 station in Ind. T., on the 14–15th; at 1 station in Kans., on the 14–15th; at 1 station in Mo., on the 14–15th; at 1 station in Ohio, on the 16–17th; at 1 station in Tenn., on the 17th; and at 1 station in Tex., on the 15th. Among the heavier rainfalls reported for this period are: 7.91, at Cheneyville, La., 15–16th; 5.00, at Lake Charles, La., 16th; and 4.08, at Central City, Ky., 15–16th.

In November of previous years precipitation to equal or exceed 2.50 in 24 hours has been reported for 16 years in La. and Tex.; for 14 years in N. C.; for 11 years in Mass. and Tenn.; for 10 years in Ala. and Ill.; for 9 years in Fla., Miss., and N. Y.; for 8 years in Ga. and Mo.; for 7 years in Ind. and N. J.; for 6 years in Conn., Kans., Ohio, Oregon, and Pa.; for 5 years in Ark., Cal., Iowa, Me., N. H., S. C., and Wash.; for 4 years in Mich.; for 3 years in Del., Ky., Md., R. I., and Va.; for 2 years in Colo. and Wis.; and for one year in Ariz., D. C., Ind. T., N. Mex., Vt., and W. Va. In states and territories other than those named precipitation to equal or exceed 2.50 in 24 hours has not been reported for November of preceding years. Among the heavier 24-hour rainfalls reported for November are: 10.39 at Fort Barrancas, Fla., 26th, 1878; 10.04 at San Luis Obispo, Cal., 17–18th, 1885; 7.10 at Point Pleasant, La., 20th, 1877; 7.00 at Marion, Ala., 6–7th, 1885; 7.00 at Melissa and Belmont Farm, Tex., 1st, 1877. Exclusive of the instances and years cited precipitation to equal or exceed 5.00 in 24 hours in November has been reported for 2 years in Tex.; and for one year in Fla., La. N. Y., N. C., Pa., and S. C.

Precipitation to equal or exceed 1.00 in one hour was reported at one station in Fla., on the 19th, and at one station in Miss., on the 16th. Remarkably heavy rainfall in one hour was not reported in November, 1890, and excessive rainfall for 5 and 10 minute periods is given in the table of "Maximum rainfall in one hour or less."

In November of preceding years precipitation to equal or exceed 1.00 in one hour has been reported for 6 years in Tex.; for 3 years in N. C. and Tenn.; for 2 years in Cal., Fla., Ind., Miss., and N. Y.; and for one year in Ala., D. C., Ga., Kans., Ky., Mich., Nebr., Pa., and Va. In states and territories other than those named precipitation to equal or exceed 1.00 in one hour has not been reported for November of preceding years. Among the heavier rainfalls reported for one hour or less in November are: 0.25 in 2 minutes, at New York City, 18th, 1886; 1.48 in 15 minutes, at Galveston, Tex., 5th, 1877; 1.82 in 20 minutes, at Vicksburg, Miss., 15th, 1879; 3.50 in 30 minutes, at Galveston, Tex., 2d, 1873.

Table of excessive precipitation, November, 1890.

State and station.	Monthly rainfall to inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Arkansas.	*Inches.*	*Inches.*		*Inches*	*h. m.*	
Forrest City		3.44	17			
Florida.						
Jupiter		2.70	29			
Key West				1.10	0 56	19
Micco		2.80	29			
Tampa		2.50	28, 29			
Oklahoma Territory.						
Oklahoma City		3.30	14, 15			
Kansas.						
Sedan		2.95	14, 15			
Kentucky.						
Canton		3.20	15, 16			
Central City		4.08	15, 16			
Princeton		3.00	16			
Louisiana.						
Alexandria		4.59	16, 17			
Cameron		2.80	16			
Cheneyville		7.91	15, 16, 17			
Farmerville		3.52	16			
Lake Charles		5.00	16			
Monroe		3.43	17			
Port Eads		4.22	17			
Shell Beach		2.50	16			
Mississippi.						
Logtown		3.00	16	3.00	2 00	16
Pearlington		3.00	16			

Table of excessive precipitation—Continued.

State and station.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Missouri.	*Inches.*	*Inches.*		*Inches*	*h. m.*	
Austin		3.50	14, 15			
Ohio.						
Leipsic		2.84	16, 17			
Tennessee.						
Covington		2.60	17			
Texas.						
Columbia		3.06	15			
Received too late to be used in general discussion for November, 1890.						
Florida.						
Homeland		2.75	29			
Iowa.						
Hampton		2.80	8			
Received too late for publication in October, 1890.						
Texas.						
Corsicana (1)		2.75	5, 6			
Washington.						
Tatoosh Island	13.69	4.50	20			

MAXIMUM RAINFALL IN ONE HOUR OR LESS.

The following table is a record of the heaviest rainfall during November, 1890, for periods of five and ten minutes and one hour, as reported by regular stations of the Signal Service furnished with self-registering gauges:

Station.	Maximum fall in—					
	5 min.	Date.	10 min.	Date.	1 hour.	Date.
	Inch.		*Inch.*		*Inch.*	
Bismarck, N. Dak†						
Boston, Mass	0.02	17	0.03	17	0.10	17
Buffalo, N. Y	0.05	17	0.10	17	0.32	17
Cincinnati, Ohio	0.05	17	0.05	17	0.10	17
Chicago, Ill †						
Cleveland, Ohio	0.08	17	0.14	17	0.39	17
Denver, Colo §						
Detroit, Mich	0.05	17	0.08	17	0.27	17
Dodge City, Kans	0.02	8	0.05	8	0.20	8
Duluth, Minn ‡						
Eastport, Me	0.02	18	0.04	18	0.17	18
Galveston, Tex	0.15	15	0.25	15	0.95	15
Jupiter, Fla	0.30	29	0.35	29	0.95	29
Key West, Fla †						
Marquette, Mich §						
Memphis, Tenn	0.11	15	0.15	15	0.35	15
New York City	•		0.01	11	0.07	11
New Orleans, La	•		•		0.05	15
Norfolk, Va †						
Philadelphia, Pa	•		0.01	11	0.08	11
Philadelphia Water Works			0.02	11	0.11	11
Portland, Oregon	•		0.01	23	0.05	23
Saint Louis, Mo	0.05	8	0.12	8	0.23	8
Saint Paul, Minn †						
San Diego, Cal	0.05	7	0.05	7	0.20	7
San Francisco, Cal	0.00		0.00		0.00	
Savannah, Ga	0.03	13	0.05	13	0.20	13
Washington City	0.02	13	0.05	13	0.08	13
Wilmington, N. C	0.03	14	0.05	14	0.08	13

• Not sufficient to register. † Rain-gauge not working. ‡ Less than .05 in 1 hour. § No record on account of snow.

SNOW (snowfall in inches and tenths).

The first snow of the season was reported as follows: 1st, Royalston, Mass.; Massena and Rochester, N. Y.; Edinborough, Pa.; Madison, Wis. 2d, Hampton, Iowa; Willow Springs, Mo.; Cockerell and Oswego, Ill.; Dubuque, Iowa; Albany, N. Y.; Wooster, Ohio; Nisbet and Tipton, Pa.; Cadiz and La Crosse, Wis. 4th, Eastport, Me.; Harrisburg, Philadelphia, Quakertown, and Salem Corners, Pa.; Beverly, N. J.; Fort Niagara and Fort Porter, N. Y. 5th, Susanville, Cal.; Carson, Iowa; Fort Missoula, Mont.; Spearfish, S. Dak.; Richmond, Va.; Fort McKinney, Wyo. 6th, Sierra Nevada Mountains (near Keeler), and mountains near Red Bluff, Cal.; Toro Mountians (near Salinas, Cal.); Montevideo, Minn.; Millbank, Huron, and Rapid City, S. Dak. 7th, Alta, Bancroft, Cresco, Osage, and Stilson, Iowa; Morris and Ortonville, Minn.; Princeton, Mo.; Glendive, Mont.; Valentine and North Platte, Nebr.; Chama and Estalina Springs, N. Mex.; Oxford, Turin, Lebanon Springs, Setauket, and Honeymead Brook, N. Y.; Lossee, Utah. 8th, Fort Grant, Payson, hills near Simmons, Ariz.; Vinton, Webster City, Clinton, West Bend, Des Moines, Belle Plaine, Blakeville, Carroll, Cedar Rapids, Carson, Clarinda, Eagle Grove, Indianola, Grinnell, Maquoketa, Monticello, Osage, and Panama, Iowa; Minneapolis, Minn.; mountains near Omaha, De Soto, and Genoa, Nebr.; Santa Fe, Fort Marcy, and Embudo, N. Mex.; Wahpeton, N. Dak.; Kimball, S. Dak.; Lincoln and Wauzeka, Wis. 9th, Strawberry, Ariz.; Kansas City, Mo.; Onida, S. Dak. 11th, Manchester, N. H.; Portland, Me.; Wood's Holl, Amherst, Westborough, and Worcester, Mass. 12th, Holbrook and Springerville, Ariz.; New Haven, Conn.; Cornish, Me. 13th, Fort Apache, Ariz.; Palermo, N. Y. 14th, Fort Stanton and Gallinas Springs, N. Mex. 15th, Albert, Fort Union, Hillsborough, and Hill's Ranch, N. Mex.; Hartley, Tex. 16th, Dodge City, Allison, Gove City, and Lakin, Kans. 17th, Shields, Kans.; Plattsburgh Barracks, N. Y. 18th, Kennebec Arsenal, Me. 19th, Cooperstown, N. Y.; Mount Alto, W. Va. 20th, Atlantic City, Vineland, and Moorestown, N. J.; New Hartford, Conn.; Hanover, N. H.; Phœnixville, Troy, and York, Pa.; Burlington, Vt. 22d, Minden, Conn.; Fall River, Mass. 23d, Boston, Nantucket, Dudley, Fort Warren, and Taunton, Mass.; New London and Hartford, Conn.; New York City and Rondout, N. Y.; Kingston, R. I. 26th, Milton, Mass. 27th, Washington City; Vineyard Haven and Brewster, Mass.; Egg Harbor City, N. J.; Fort Columbus and Fort Schuyler, N. Y.; Shiloh and Tiffin, Ohio; Westtown, Pa. 28th, New Brunswick, N. J. 30th, Mount Sterling, Ky.

A general snow storm prevailed over the Dakotas, Minnesota, Nebraska, and northwest Iowa on the 8th. This was the first heavy snow of the season in that region. Snow fell generally in central and western New York the evening and night of the 22d.

Snowfalls of five inches or more were reported as follows, and in states and territories where the maximum depth was below that amount, the station reporting the greatest is given: *Arizona.*—Springerville, 8; Woodruff, 5. *California.*—Susanville, 3.5. *Colorado.*—Cumbres, 27; Stamford, 21.5; Breckenridge, 15; Smoky Hill Mine, 14; Box Elder, 12; Como (near), 10.3; Canon City, 8; Elkhorn, 7.5; Bennet and San Luis, 7; Alma, Dillon, and Moraine, 6.5; Westcliffe, 6.2; Amherst and Georgetown, 6; Le Roy, Wray, and Yuma, 5. *Connecticut.*—Falls Village, 4. *Delaware.*—Dover, trace. *District of Columbia.*—Washington City, trace. *Idaho.*—Mullan, 5. *Illinois.*—Belvidere, 1.8. *Indiana.*—Angola, 1.1. *Iowa.*—Sac City, 4. *Kansas.*—Lakin and Monument, 3. *Kentucky.*—Shelbyville, trace. *Maine.*—Fairfield and Mayfield, 6. *Maryland.*—Baltimore and Woodstock, trace. *Massachusetts.*—Gilbertville, 4. *Michigan.*—Marquette, 20; Atlantic, 13; Calumet, 12.2; Cheboygan, 9.7; Lathrop, 8.5; Berrien Springs, 8; Fort Mackinac, 7.8; Harrison, 7.5; Crystal Falls, 6.8; Caldwell, 6; Charlevoix, 5. *Minnesota.*—Pokegama Falls, 9; Duluth, 8.5; Lake Winnibigoshish, 7.4; Fort Snelling, 7.2; Leech Lake, 6.5; Pine River, 5.8; Red Wing, 5.2; Farmington, Fort Ripley, Le Sueur, and Ortonville, 5. *Missouri.*—Kansas City, Pickering, Princeton, and Saint Joseph, trace. *Montana.*—Fort Shaw, 7; Choteau, 5. *Nebraska.*—Kimball, 10; Valentine, 8.1; Bassett and Crete, 8; Gering, 6.4; Hay Springs and Palmer, 6; Fort Niobrara and Kennedy, 5. *Nevada.*—Pioche, 6; Belmont, 5. *New Hampshire.*—Berlin Mills, 7. *New Jersey.*—Oceanic, 0.3. *New Mexico.*—Estalina Springs, 8.8; Chama, 8; Santa Fé, 7.6; Fort Stanton, 7; Fort Marcy and Hillsborough, 5. *New York.*—Utica, 13; Brookfield and Quaker Street, 12; Chittenango, 10.8; Arcade, 8.9; Bethlehem Centre and Cooperstown, 8; Schodack Depot and Turin, 7; Perry City, 5.1; Malone, 5. *North Dakota.*—Wahpeton, 4. *Ohio.*—Wheeler, 5.2. *Oregon.*—Joseph, 2.5. *Pennsylvania.*—Blue Knob, 5.5.

Rhode Island.—Bristol, Kingston (2), Lonsdale, and Pawtucket, trace. *South Dakota.*—Fort Meade, 12; Webster, 9; Kimball, 6.5; Fort Sully, 6.2; Fort Randall, 6; Fort Bennett, 5.8; De Smet, Onida, and Yankton, 5.5; Wolsey, Alexandria, Flandreau, Howard, and Woonsocket, 5. *Tennessee.*—Greeneville and Nunnelly, trace. *Texas.*—Hartley, 3. *Utah.*—Taylor's Ranch, 9. *Vermont.*—East Berkshire, 6. *Virginia.*—Richmond, trace. *West Virginia.*—Tyler's Creek, 1.1. *Wisconsin.*—Green Bay, 9.2; Koepenick, 7.6; Phillips, 7.2; Chippewa Falls, Grantsburgh, Greenwood, 7; Medford (1), 5.5; Peshtigo, 5.3; Embarrass, 5.2; Lincoln, 5. *Wyoming.*—Camp Pilot Butte, 5.4; Cheyenne, 5.

The greatest depth of snowfall reported was 27.0, at Cumbres, Colo. At Marquette, Mich., 20.0 fell. At elevated stations in central Colo. the snowfall exceeded 15.0. It exceeded 10.0 in extreme north upper Mich., southwest Nebr., central N. Y., and west-central S. Dak.; and equalled or exceeded 5.00 in east-central Ariz., north Idaho, west-central Me., central and southwest lower Mich., a greater part of Minn., west-central Mont., north Nebr., east-central and central Nev., north N. H., central and west N. Mex., south-central Pa., northeast Ohio, generally in S. Dak., in central Utah, north Vt., north Wis., and south Wyo. Trace of snowfall was reported north of a line traced from south N. J. irregularly west-southwest to north-central Tenn., thence irregularly northward to east Iowa, thence southwestward to southeast Ariz., thence northwestward over east Cal. to north-central Cal., and thence northeastward to north Idaho.

DEPTH OF SNOW ON GROUND AT CLOSE OF MONTH.

Chart IV shows the depth of snow reported on the ground at the close of the month. The greatest depth of snow reported was 15.0, at Cumbres, Colo.; 8.0 was reported at Marquette, Mich.; 3.0 in central N. Y.; 2.0 in north Wis., north Minn., and central Colo.; 1.0 in north Vt. and north N. H.; and trace north of a line traced from north N. H. southwestward to central Ohio and thence northwestward to northeast Mont., at elevated stations in the east part of the plateau regions as far south as east-central Ariz., in northeast south Idaho, and north-central Oregon.

HAIL.

Hail was reported as follows: 1st, Mich., Wis. 2d, Mich., Ohio, Pa. 3d, Ind., Mich., Ohio. 7th, Ariz., Colo. 8th, Ill., Ind., Miss., Wis. 9th, Vt., Wis., Wyo. 10th, Tex. 11th, Conn., N. J., N. Y. 12th, Pa. 13th, Ariz., Mont. 14th, N. Mex. 15th, Conn. 19th, N. J., N. Y., Pa. 20th, Md., N. J., Pa. 21st, N. Mex. 22d, Utah. 25th, Pa. 27th, N. Mex., Va. 30th, Wis.

SLEET.

Description of the more severe sleet storms of the month is given under "Local storms." Sleet was reported as follows: 1st, Mich., N. Y. 2d, Mich., N. Y., Ohio, Va. 3d, Ill., Mich., N. Y., Ohio, Tenn., Vt. 4th, Mich., N. Y. 5th, Va. 7th, Ariz., Iowa, Kans., Nebr. 8th, Ill., Iowa, Kans., Minn., Mo., Nebr., N. Mex., N. Y., Ohio, Wis. 9th, Iowa, Me., Wis. 10th, N. Y., Ohio, Wis. 11th, Conn., Mass., N. H., N. Y., Ohio. 12th, Conn., N. Y., Pa. 16th, Nebr. 17th, Vt. 19th, N. Y., Ohio, Pa. 20th, N. Y. 21st, N. Mex. 22d, N. Y., N. Mex. 23d, Conn., N. Y. 24th, Tenn. 25th, Nebr., N. Y., S. Dak. 26th, Mo., N. Y. 27th, Mich. 29th, Vt. 30th, N. Y., Ohio, Tenn., Wis.

WINDS.

The prevailing winds during November, 1890, are shown on chart 11 by arrows flying with the wind. In New England, the middle Atlantic states, the lower lake region, the Missouri Valley, and on the northeast slope of the Rocky Mountains the winds were generally from southwest to northwest; on the coast of the south Atlantic states, and on the north Pacific coast, from north to east; over Florida from northeast to east; in the east and west Gulf states from northwest to northeast; in the lower Rio Grande valley and on the middle Pacific coast from northwest to north; in the Ohio Valley, the upper lake region, and the upper Mississippi valley from south to west; in the extreme northwest from the northwest; on the middle-eastern slope of the Rocky Mountains from southwest to north; on the southeast slope of the Rocky Mountains from south to southwest; on the south Pacific coast from west to northwest; and in Tennessee, and over the plateau regions, variable.

HIGH WINDS (in miles per hour).

Wind velocities of 50 miles, or more, per hour were reported at regular stations of the Signal Service, as follows: 2d, 52, sw., at Buffalo, N. Y. 9th, 62, sw., at Cleveland, Ohio. 12th, 52, sw., at Fort Assinniboine, Mont. 18th, 54, se., at Wood's Holl, Mass. 20th, 55, nw., at Kitty Hawk, N. C. 22d, 54, sw., at El Paso, Tex. 24th, 50, n., at Wood's Holl, Mass. 29th, 52, nw., at Key West, Fla.; 52, ne., at Titusville, Fla.

LOCAL STORMS.

On the 2d a severe storm with sleet began at Oswego, N. Y., at 5.13 p. m. and ended 10.33 p. m., during which the wind attained a velocity of 36 miles per hour from the nw. and sw. Three schooners, bound for Toronto, were driven back, and one schooner went ashore near the Life Saving Station. At Buffalo, N. Y., the gale was the severest of the season; it set in at 12.10 p. m.; reached a velocity of 52 miles from the sw., and continued until 7.20 p. m. The inner and outer breakwaters were submerged, but no disasters occurred. At Alpena, Mich., a brisk n. wind, with snow, began 5.30 a. m. and lasted until 5.10 p. m. A schooner valued at $10,000 was wrecked on Middle Island, 18 miles ne. of Alpena, but the crew was saved. At Marquette, Mich., a severe wind, with snow, prevailed, and a number of vessels lost their deck load of lumber. On the 3d a west gale, with heavy snow, prevailed at Grand Haven, Mich., in the evening. A heavy sea was running in the lake, and many vessels were driven into the harbor. On the 5th a severe storm prevailed on the lake at Alpena, Mich; a schooner went aground on North Point, about 15 miles north of Alpena. At Marquette, Mich., the wind reached a velocity of 44 miles per hour from the sw. On the 6th a heavy gale prevailed at Green Bay, Wis., and a very heavy sea was running on the bay and lake. On the 7th high winds, with rain, prevailed at Fort Bowie, Ariz., in the early morning; a tin roof was blown off, telegraph lines were prostrated, etc. A heavy sleet storm began at Concordia, Kans., in the evening, causing damage to trees. On the 9th a heavy gale, with rain, began at Cleveland, Ohio, at 7.31 a. m. and continued until 12.18 p. m., during which a wind velocity of 62 miles was reached. At Healdton, Ind. T., a heavy wind storm in the early morning damaged buildings and uprooted trees. On the 11th and 12th a high "norther" prevailed in California, and in places the wind reached 60 miles per hour. Near Los Angeles heavy north winds prevailed off the coast. A tug boat and lighter were driven ashore on Catalina Island and wrecked, and one man was drowned. The wind was very severe in the valleys, where damage was reported to the orange crop. Considerable electrical energy was displayed during the gale, and the wood work surrounding the switch-board in the Western Union Telegraph office at Los Angeles was set on fire by sparks. On the 15th a severe wind from the sw. prostrated trees and fences and damaged ungathered cotton at Fayette, Miss. On the 16th great havoc was done by high winds and heavy rain in Louisiana; fences and out-houses were blown down, and large quantities of rice, cotton, and cane were destroyed.

On the 17th, at 5 p. m., a tornado was reported as having